DOCUMENT RESUME

ED 186 092 PS 011 197

AUTHOR Lodico, Marguerite G.; Ghatala, Elizabeth S.
TITLE Training Rehearsal Strategies in Children.
PUB DATE 1 Feb 79
NOTE 14p.; Paper presented at the meeting of the Southwest Educational Research Association (February 1, 1979).

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Elementary Education; *Feedback; *Memory; *Recall (Psychology); *Training Methods; *Young Children
IDENTIFIERS Metamemory; *Rehearsal (Memory); Rehearsal Strategies

ABSTRACT

The effects of a training procedure for modifying children's rehearsal techniques on memory tasks were investigated in this study. Thirty second-grade children were randomly assigned to feedback and no feedback conditions in an experiment conducted in four phases: baseline, training, immediate transfer, and delayed transfer. Four lists of 18 grade-appropriate, high frequency nouns were selected from Thorndike and Lorge (1944). One list was used to collect baseline data and the remaining three lists were used for training, immediate transfer, and delay transfer tasks. Following each study/test trial conducted during training, the feedback group was shown how their performance improved when they used a many-item rehearsal strategy. A brief math test was administered for five minutes immediately following training. Children were then given the immediate transfer task. One week later, they were given the delay transfer task. A repeated measures analysis of variance was performed for group, stage and serial word position variables. Among the results, the analysis indicated an overall significant difference between the two groups in rehearsal and a marginally significant difference between the two groups in recall. (Author/RH)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

ED186092

Training Rehearsal Strategies in Children

Marguerite G. Lodico and Elizabeth S. Ghatala

University of Houston

Foundations of Education
University of Houston
Houston, Texas 77004

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Marguerite G. Lodico

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

A paper presented to the Southwest Educational Research Association, February 1, 1979

PS011197

Introduction

The purpose of the present experiment was to explore, in a preliminary fashion, effective training procedures for modifying children's rehearsal techniques on memory tasks. It has been well established that there are developmental changes in rehearsal activity. For one thing, there appears to be a shift from passive to active involvement in the memory process. That is, young children will often do nothing to improve their remembering of certain information, while older children will engage in active rehearsal (e.g. Flavell, Beach & Chinsky, 1967; Hagen, 1971; Liberty & Ornstein, 1973).

Along with this developmental change in the probability of rehearsal, there also seems to be a change in how children rehearse once it is engaged in spontaneously. Current research has found an age related increase in the number of previously presented items included in a rehearsal set (e.g. Kellas, McCauley & McFarland, 1975; Ornstein, Naus & Liberty, 1975; Cuvo, 1975; Naus, Ornstein & Kreshtool, 1977).

In addition to simply charting developmental changes in rehearsal activity, investigators in this area have been concerned with the question of whether rehearsal activity can be modified by training. In general, results from this line of research indicate that young children can perform many memorial activities when induced to do so by an adult, but they are unlikely to maintain this activity (see Hagen, Jongeword & Kail, 1975 for a review of this literature). Thus, for example, Keeney, Cannizzo & Flavell (1967) in a short term free recall task, were able to induce rehearsal in first graders who did not rehearse spontaneously. However, the strategy was abandoned in a transfer task given several

weeks later.

Ornstein, Naus & Stone (1977) attempted to modify rehearsal techniques which children engage in spontaneously. They demonstrated that second graders, who spontaneously rehearse items in isolation could be trained to rehearse several items together in a free recall task. The children were able to maintain the new strategy on a transfer task administered five minutes later. While with this very brief interval subjects were able to maintain the new strategy, it is reasonable to suppose that the modification produced by the training would be of short duration as with the Keeney et al (1967) study.

The instructions in the above training studies did not include any information about what effect the use of the new strategy might have on the subjects memory. It is possible that such training did not produce long term effects because the subjects were not aware of its benefits - a type of metamemory deficiency (cf, Flavell & Wellamn, 1977). Metamemory refers to the knowledge and beliefs one has concerning the activities of remembering and oneself as a memorizer. Recent studies have shown that metamemorial process develop with age (e.g. Kreutzer, Leonard & Flavell, 1975; Appel, Cooper, McCarrell, Sims, Knight, Yussen & Flavell, 1972). With metamemorial knowledge, a child is more likely to engage in appropriate strategy useage when faced with a memory task (Wellman, Drozdal, Flavell, Salatas & Ritter, 1975).

Perhaps the use of feedback would demonstrate to children the positive effect strategy useage would have on their recall. In this regard, Kennedy & Miller (1976) found that feedback has a facilitative effect on the short term maintanence of the strategy for

children who did not rehearse spontaneously. Subjects who received feedback were able to maintain the strategy over several trials on an immediate transfer task while subjects who did not receive feedback quickly abandoned the strategy.

The form of feedback in the Kennedy & Miller (1976) study involved subjects simply being told that their performance improved when they engaged in the strategy. While this type of feedback was successful in getting children to maintain the strategy over a short period of time(one to two minutes), there is some evidence to suggest that more effective forms of feedback might be necessary for maintenance over longer periods(Moynahan, 1978). It may be that requiring children to deduce and verbalize the connection between improved performance and strategy useage will lead them to a deeper understanding of the relationship between performance and strategy utilization. This would in turn increase the likelihood of their engaging in the strategy on a delayed transfer task.

The present study represents an initail step in the search for strategy training procedures which produce long term modification of childrens' rehearsal activity. The goal of the study was to ascertain whether long term maintenance of the previously described multiple item rehearsal strategy in free recall(Ornstein, Naus & Liberty, 1975; Ornstein, Naus & Stone, 1977) could be achieved in a training condition which combined those factors (e.g. providing feedback and requiring children to verbalize the relationship between performance and strategy utilization), which should maximize children's metamemorial awareness of the value of the strategy. A successful outcome would provide impetus for a larger study designed to systematically explore the contributions of each factor.

Method

Subjects. Thirty second grade volunteers from a parochial school in a middle class neighborhood were used in the study. Second graders were chosen since it has been shown that they rehearse spontaneously. In addition, second graders rehearse items in isolation(Ornstein, et al, 1975).

Design. The children were randomly assigned to two conditions - feedback and no feedback. The experiment was conducted in four phases - baseline, training, immediate transfer and delay transfer. The two groups were treated differently during the training phase only.

Materials. Four lists of 18 high frequency nouns were selected from Thorndike & Lorge, 1944. All words were chosen so that they could be understood by second graders. Two second grade teachers reviewed the lists to help determine its appropriateness. One list was used in a preliminary free recall task to collect baseline data on all subjects. The remaining lists were used for the training, immediate transfer and delay transfer tasks.

Procedure. All children were tested individually. The word lists were presented both orally and visually by the experimenter with one word presented every five seconds. At the start of the experiment, each child was given a list of eighteen words to remember and a free recall test. They were instructed to do whatever they could to remember the words. This was used as baseline data and a point of comparision for the feedback group.

The children were then presented with a sample list of ten words and were instructed to rehearse the current words with three of the previously presented words. With this sample list, the experimenter demonstrated to the children the multiple item rehearsal strategy. Following this demonstration, the children were given

four study/test trials with a list of 18 words. They were told to practice outloud so that their rehearsal activity could be tape recorded. Each child was exposed to four random arrangements of the training list.

Following each study/test trial during training, the feedback group was shown how their performance improved when they used the many item rehearsal strategy. The method of feedback involved placing a bead on a pole for every correctly recalled word. The subjects were asked to compare their performance on these trails to the first recall task. They were then asked what they thought improved their performance. It was hoped that the subjects would conclude that the new strategy helped improve their memory. If they were not able to conclude that the new strategy improved their performance, the experimenter helped them to make the connection. The children in the no feedback group received no information about the effect the new strategy had on their performance.

A brief math test was administered for five minutes immediately following training. The children were then given the transfer task consisting of two study/test trials. They were told to try to remember as many words as possible, but were not instructed to use the new strategy. One week later, on the delay transfer task the children were given an additional list of words to remember. The instructions were identical to the immediate transfer task. During both transfer tasks children rehearsed cutloud.

Results

The dependent variables were number of items in a rehearsal set and recall. A rehearsal set was defined as the number of different items rehearsed together between the presentation of any one item and the next. The dependent variables were measured at each

of the following stages of the study: baseline, training, immediate transfer and delay transfer. Inspection of baseline data indicated that children were rehearsing items in isolation. Baseline recall scores were virtually identical for the two groups indicating that the groups were of equivalent ability.

A repeated measures analysis of variance was performed for each dependent variable with group (feedback vs no feedback) as a between subjects factor and stage (training, immediate transfer and delay transfer) and serial position (position of the words in the list with two words representing each position) a within subjects factor.

Rehearsal Set

The analysis indicated an overall significant difference between the two groups $F(1,28)=9.49$ $p<.05$. The feedback group rehearsed an average of 2.6 words per rehearsal set while the no feedback group rehearsed 1.8 words. Rehearsal also varied across stages of the experiment $F(2.56)=42.0$ $p<.05$. Post hoc analysis revealed that rehearsal was equivelent on training and immediate transfer. However, there was a significant decrease in the number of items in a rehearsal set in the delay transfer. During training children rehearsed on an average 3.0 words together. This suggested the effectiveness of the training since the baseline data revealed that subjects were rehearsing items in isolation. There was a slight decrease during the immediate delay with subjects rehearsing 2.5 words per rehearsal set. On the delay transfer task children were combining 1.7 words in a rehearsal set.

A significant interaction between group and stage revealed that the two groups differed in the delay stage only. On the delay transfer task, the feedback group rehearsed 2.2 words per rehearsal

set while the no feedback group rehearsed 1.05 words together. The interaction is displayed in Figure 1.

INSERT FIGURE 1 HERE

The three way interaction of group by stage by serial position was also significant $F(4,448)=3.95$ $p<.05$. This interaction, as displayed in Figure 2, merely recapitulates the finding that the difference in rehearsal activity between the two groups increases across the stages. Obviously, the differences between the groups on tendency to rehearse items together can only emerge after several items have been presented.

INSERT FIGURE 2 HERE

Recall

For the recall data, there was marginal significance between the two groups $F(1,28)=3.96$ p .057, with the feedback group recalling more words than the no feedback group. Recall also varied significantly across stages of the experiment $F(2,56)=73.0$ $p<.05$. Post hoc analysis revealed a difference between training and immediate transfer and training and delay transfer. There was no difference between immediate and delay transfer. Thus, subjects were recalling more words during the training when they were using the new strategy efficiently.

A significant main effect was found for serial position $F(8,224)=30.03$ $p<.05$. Post hoc analysis showed position one to be different from positions two through eight but not nine, indicated a recency and primacy effect.

Discussion

Consistent with the literature on training, this experiment was successful in getting children who rehearse by only naming each

word once in isolation to use a more efficient strategy. When looking at the stability of this training, it was found that all children were able to maintain the strategy after five minutes. However, after one week only three out of the fifteen subjects in the no feedback group maintained the strategy. In the feedback condition ten out of the fifteen subjects maintained the strategy. This would indicate that when the subjects were aware of the value of the strategy, they were more likely to use it. However, their efficiency in using the strategy decreased over time.

According to Ornstein et al.(1975) recall with the use of a cummulative rehearsal strategy should improve over simply naming items once. This being the case, once would have expected an interaction between group and stage for the recall scores. Since the feedback group did maintain the strategy in the delay phase, their recall should have been higher than the no feedback group. As the rehearsal set data indicates, the feedback groups efficiency decreased from the training to the delay transfer. That is, they were rehearsing fewer items together during the delay transfer. It is possible then that the less efficient use of the strategy influenced the lack of higher recall scores.

The interesting question becomes can children be trained to efficiently maintain the new strategy over an extended period of time(more than one week). This and other studies indicate that increasing a subjects metamemorial awareness would increase the likelihood of appropriate strategy useage. Additional research is needed to determine the relative contribution of the two facotrs (visual informational feedback and inducing the child to infer the relationship between performance and strategy) which were combined in the present feedback condition.

FIGURE 1

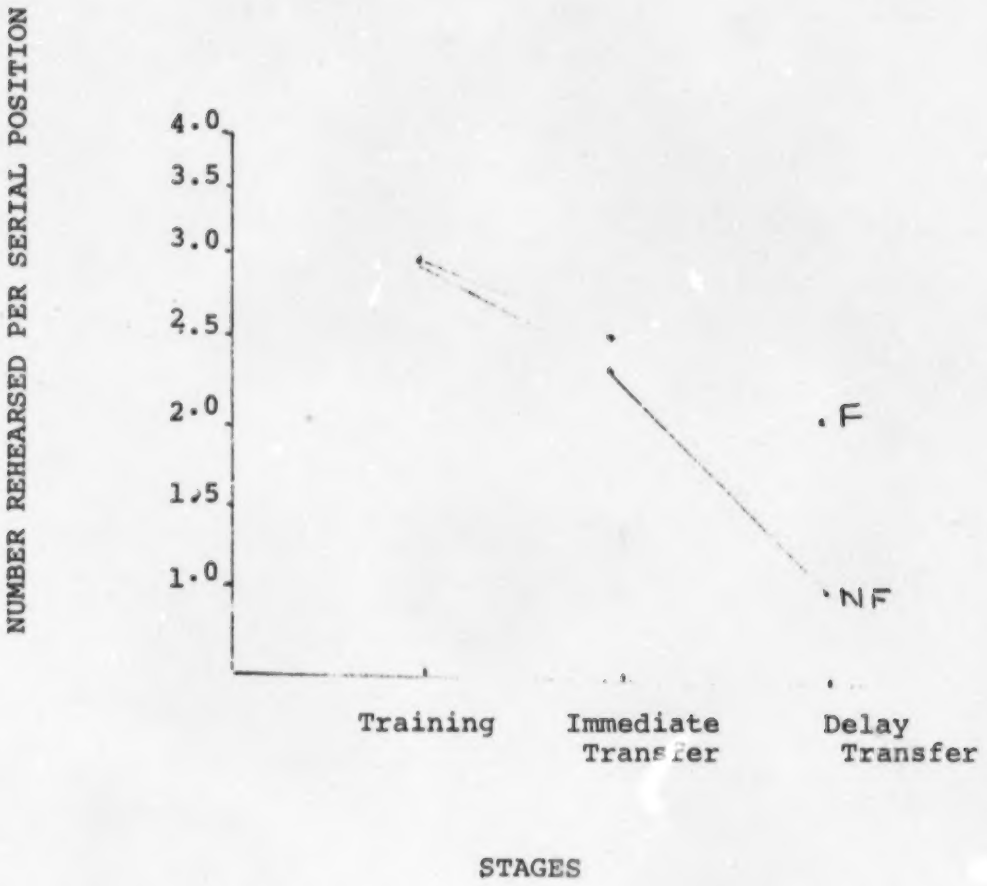
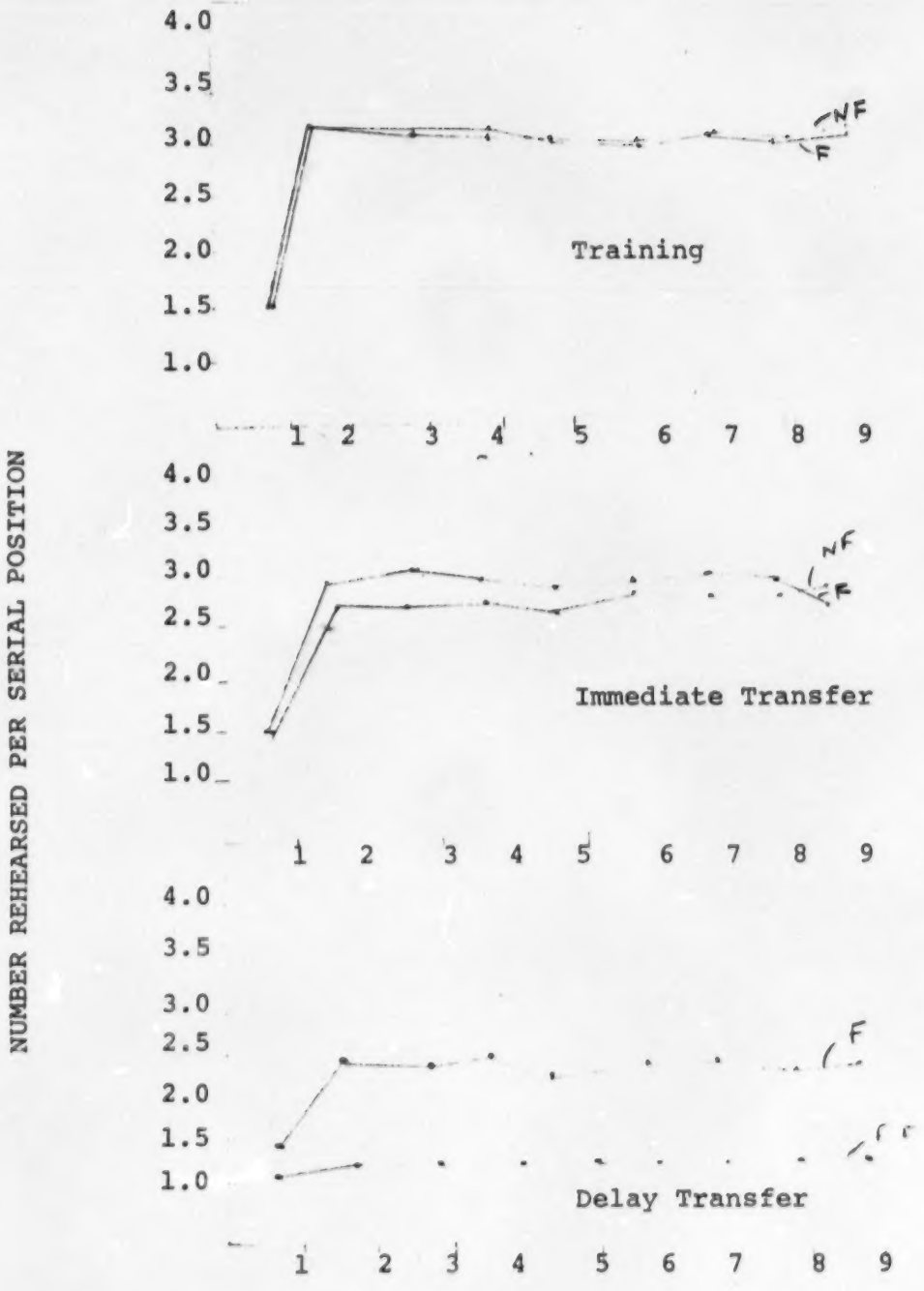

NUMBER REHEARSED PER SERIAL POSITION
4.0
3.5
3.0
2.5
2.0
1.5
1.0
F
NF
Training
Immediate Transfer
Delay Transfer
STAGES

FIGURE 2


NUMBER REHEARSED PER SERIAL POSITION
4.0
3.5
3.0
2.5
2.0
1.5
1.0
NF
F
Training
1 2 3 4 5 6 7 8 9
Immediate Transfer
Delay Transfer
SERIAL POSITION
(Blocks of two items)

BIBLIOGRAPHY

Appel, L.F., Cooper R.G., McCarrell, N, Sims-Knight, J., Yussen, S.R., & Flavell, J.H. The development of the distinction between perceiving and memorizing. Child Development, 1972,43,1365-1381.

Cuvo, A.J. Developmental differences in rehearsal and free recall. Journal of Experimental Child Psychology,1975,19,265-270.

Flavell, J.H., Beach D.H., & Chinsky, J.M. Spontaneous verbal rehearsal as a function of age. Child Development, 1966, 37,283-299.

Flavell, J.H., & Wellman, H.M. Metamemory. In R.V. Kail, Jr & J.W. Hagen (Eds) Perspectives on the development of memory and cognition, 1977.

Hagen, J.W. Some thoughts on how children learn to remember, Human Development, 1971, 14, 262-271.

Hagen, J.W., Jongeword, R.H. & Kail, R.V. Cognitive perspectives on the development of memory. In H.W. Reese (Ed) Advances in child development and behavior, Vol. 10, New York: Academic Press, 1975.

Keeney, T.J., Cannizzo, S.R. & Flavell, J.H. Spontaneous and induced verbal rehearsal in a free recall task, Child Development, 38, 953- 966.

Kellas, G. McCauley, C. & McFarland, C.E. Developmental aspects of storage and retrieval, Journal of Experimental Child Psychology, 1975, 19, 51-62.

Kennedy, B. & Miller, D. Persistent use of verbal rehearsal as a function of information about its value, Child Development, 1976, 47, 566-569.

Kreutzer, M.A., Leonard, C., & Flavell, J.H. An interview study of children's knowledge about memory. Monographs of the Society for Research in Child Development, 1975, 40 (1,Serial No. 159).

Liberty, C. & Ornstein, P. Age differences in organization and recall, the effects of training on categorization, Journal of Experimental Child Psychology, 1973, 15, 169-186.

Moynahan, E.D. Journal of Experimental Child Psychology, 1978, 26, 257.

Naus, M.J. Ornstein, P.A. & Kreshtool, K. Developmental differences in recall and recognition: the relationship between rehearsal and memory as test expectation changes, Journal of Experimental Child Psychology, 1977,23,252-265.

Ornstein, Naus,M.J. & Liberty, C. Rehearsal and organizational processes in children's memory, Child Development, 1975, 46, 818-830.

Ornstein, P., Naus, M.J. & Stone, B. Rehearsal training and developmental differences in memory. Developmental Psychology, 1977, 13, 15-24.

Wellman, H.M., Drozdal, J.G., Flavell, J.H., Salatas, J., & Ritter,K., Metamemory development and its possible role in the selection of behavior. In G.A. Hale (Chair), Development of Selective Process in Cognition. Symposioum presented at the meeting of the Society for Research in Child Development, Denver, 1975.